



PATENT ABSTRACTS OF JAPAN

(11) Publication number: **58131781 A**(43) Date of publication of application: **05.08.1983**(51) Int. Cl. **H01L 33/00**(21) Application number: **57013457**(71) Applicant: **NEC CORP**(22) Date of filing: **29.01.1982**(72) Inventor: **SUZUKI AKIRA****(54) SURFACE LUMINOUS TYPE LIGHT-EMITTING DIODE****(57) Abstract:**

PURPOSE: To obtain the surface luminous type light-emitting diode, in which an optical output radiant component to a semiconductor substrate is reflected and condensed, and absorbed and light-emitted again in a light-emitting region and effective luminous quantum efficiency is improved, by forming the substrate to a semispherical shape formed centering around the light-emitting region and constituting an optical reflecting mirror onto the semispherical shape.

CONSTITUTION: Residual approximately 27% obtained by subtracting approximately 3% of total optical output transmitting a light extracting window section from approximately 30% of total optical output transmitting the semiconductor substrate 1 from an active layer 2 is totally reflected and condensed by an n type electrode 7 taking the semispherical shape formed centering around the light-emitting region, projected into the light-emitting region of the active layer 2 again, and absorbed and light-emitted again. When the crystal internal quantum efficiency of the active layer 2 is made 100% and absorption and re-luminous power

conversion efficiency 50%, the rise of effective luminous quantum efficiency by the optical reflection of the n side electrode 7 taking the semispherical shape is approximately 27%.

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